

VPDES PERMIT FACT SHEET ADDENDUM

This document gives pertinent information concerning the modification of the VPDES permit listed below. This permit is being processed as a minor, municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The discharge results from the operation of a municipal wastewater treatment facility. This permit action includes provision for a plant upgrade and expansion and revised effluent limitations, special conditions, and updates the formatting of portions of the permit; specifically, this major modification replaces the previously permitted 0.025 MGD and 0.050 MGD design flow tiers with a single increased design flow of 0.100 MGD. This addendum addresses only those sections of the 2005 Fact Sheet that require updating commensurate with the 0.100 MGD expansion.

1. Facility Name and Address: King William STP
542 Acquinton Church Rd.
King William, VA 23086

5. Application Complete Date: September 1, 2006
 Permit Drafted By: Virginia R. E. Kelly Date: January 13, 2009; revised January 15, 2009, April 15, 2009
 DEQ Regional Office: Piedmont Regional Office
 Reviewed By: Jaime Bauer Date: January 14, 2009
 Curt Linderman Date: March 24, 2009

6. Receiving Stream: Name: Moncuin Creek
 River Mile: 8-MNQ003.75
 Basin: York River
 Subbasin: N/A
 Section: 3
 Class: III
 Special Standards: None
 1-Day, 10-Year Low Flow: 0.053 MGD
 7-Day, 10-Year Low Flow: 0.087 MGD
 30-Day, 5-Year Low Flow: 0.40 MGD
 30-Day, 10-Year Low Flow: 0.19 MGD
 Harmonic Mean Flow: Undefined
 Tidal? NO On 303(d) list? YES

8. Reliability Class: Class I

9. Permit Characterization:
 (X) Existing Discharge (X) POTW
 (X) Effluent Limited (X) Water Quality Limited
 (X) Owner Modification (X) Discharge to 303(d) Listed Segment
 (X) Municipal, SIC Code(s): 4592

10. Wastewater Flow and Treatment: Table 1

Outfall Number	Wastewater Source	Treatment	Flow
001	Residents of King William County (Domestic and some industrial wastewaters)	Screening, equalization basin, membrane bioreactor with filtration, UV disinfection, step aeration	The modified permit will allow for an expansion to a design flow of 0.100 MGD. An interim CTO* for the 0.100 MGD facility has been issued.

See **Attachment 1** for a facility diagrams and expansion plans.

* An interim CTO was issued for this facility expansion authorizing the owner to operate these facilities at 50,000 gallons per day, until a new discharge permit is issued and the updated O&M Manual is reviewed and approved. Once this permit modification becomes effective and the revised O&M approved, the permittee will have a final CTO for design flow of 0.100 MGD.

14. Ambient Water Quality Information: Ambient water quality data from an upstream station at river mile 8-MNQ004.19 was used in this analysis; this station, located on the Route 618 bridge, was selected due to the close proximity of the discharge site (e.g. approximately 0.44 mile upstream of the discharge). [Note: The discharge location did not change with the expansion.] See **Attachment 2**.

15. Antidegradation Review and Comments:
 The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect those uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. The receiving stream, Moncuin Creek was deemed a Tier 1 waterbody during the 2004 modeling effort and antidegradation was not applied. Because this facility is currently discharging at permit limits calculated using Tier 1 methods, Moncuin Creek remains Tier 1. The waterbody is therefore, classified as Tier 1.

16. Site Inspection: May 10, 2007 by C.Stitzer. See **Attachment 3**.

17. Effluent Screening & Limitation Development:
 See **Attachment 4** for effluent data submitted with the permit application and a summarization of effluent data used in MSTRANT1.

See **Attachment 5** which presents the evaluation of the need for ammonia limitations in the permit modification. Included in Attachment 5 are the MSTRANT1 printout with WLAs and STATS.exe analyses for ammonia.

See **Attachment 6** for the new model of conventional pollutants.

18. Effluent Limitation Development: Table 2

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS					
		MO AVG		WE AVG		MIN	MAX
Flow (MGD)	NA	NL		NA		NA	NL
pH (standard units)	1	NA		NA		6.0	9.0
cBOD ₅	2	13 mg/L	4900 g/d	20 mg/L	7400 g/d	NA	NA
Total Suspended Solids (TSS)	1	30 mg/L	11 kg/d	45 mg/L	17 kg/d	NA	NA
Total Kjeldahl Nitrogen (TKN)	2	3.0 mg/L	1100 g/d	4.5 mg/L	1700 g/d	NA	NA
<i>E. coli</i>	3	126 N/100 mL		NA		NA	NA
Dissolved Oxygen (mg/L)	2	NA		NA		5.0	NA
Total Nitrogen – Year-to-Date	4	NL		NA		NA	NA
Total Nitrogen – Annual Average	4	4.0 mg/L		NA		NA	NA
Total Phosphorus – Year-to-Date	4	NL		NA		NA	NA
Total Phosphorus – Annual Average	4	0.3 mg/L		NA		NA	NA

1. Federal Effluent Guidelines – Secondary Treatment Standards
2. Best Engineering Judgment – Stream Model (Attachment 6)
3. Best Engineering Judgment – Pamunkey River TMDL (Attachment 2)
4. Best Engineering Judgment – Nutrient Regulations and DEQ Related Guidance

Nutrient Limitations: As the permittee is seeking WQIF funding for total nitrogen (TN) improvements, a TN annual average limitation of 4.0 mg/L was included and is based on correspondence with WQIF staff. WQIF funding is not being sought for total phosphorus (TP) upgrades; however, a TP annual average limitation of 0.3 mg/L was included based on projected TP performance as documented in an August 8, 2007 email from Bruce Husselbee, P.E. of HRSD as well as the final Preliminary Engineering Report (PER) (page 5-7) submitted in October 2007.

Monitoring and reporting requirements for the individual components of the nutrients (i.e. TKN, NO₃-NO₂, orthophosphate, etc) as well as the monthly average concentrations for total nitrogen were not included as these parameters are already reported on the nutrient general permit DMR. However, TN year-to-date and annual average concentration reporting requirements were included in the individual permit as these calculations are not performed or reported on the nutrient general permit DMR.

At the request of the permittee, TKN sampling was specified as an 8 HC as compared to the permit manual's recommended 4 HC (HRSD correspondence dated March 6, 2007). Also, the TSS sampling frequency was established at 1/Week at the request of the permittee (HRSD correspondence dated March 28, 2007).

For additional information regarding cBOD₅, TKN, E. coli, and DO limitations, please see the respective referenced attachment.

20. Antibalancing: Guidance Memorandum 00-2011 allows for the relaxation of limitations when a facility undergoes an upgrade, expansion, or other significant alteration; specifically, the TSS limitations were relaxed for the expansion.

22. Special Conditions – Part I.B:
Special Condition B.1 – 95% Capacity Reopener
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 2 for all POTW and PVOTW permits.

Special Condition B.2 – O&M Manual Requirement
Rationale: Required by Code of Virginia, §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.

Special Condition B.3 – Licensed Operator Requirement
Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C and the Code of Virginia § 54.1-2300 et seq., Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators.

Special Condition B.4. – Reliability Class
Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

Special Condition B.5 – Sludge Use and Disposal
Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P, 220 B 2, and 420 through 720; and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

Special Condition B.6. – Sludge Reopener
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage.

Special Condition B.7 – Compliance Reporting

Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limitation or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Special Condition B.8 – Materials Handling/Storage

Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Special Condition B.9 – Reopeners

Rationale:

- a. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.
- b. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.
- c. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Special Condition B. 10—Indirect Dischargers

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

Special Condition B. 11 – Pretreatment

Rationale: VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR part 403 require certain existing and new sources of pollution to meet specified regulations.

Special Condition B. 12 – CTO, CTC Requirement

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790. 9 VAC 25-40-70.A authorizes DEQ to include technology-based annual concentration limitations in the permits of facilities that have installed nutrient control technology, whether by new construction, expansion, or upgrade.

Special Condition B.13 – Nutrient Reporting Calculations

Rationale: §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this definition is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

Special Condition B.14 – Suspension of Annual Average Concentration Limitations for E3/E4 Facilities

Rationale: 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

Special Condition B.15 – Water Quality Criteria Monitoring

Rationale: State Water Control Law § 62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit.

24. Changes to Current Permit: Table 3

Special Conditions of Modified Permit		Rationale
From	To	
Cover page		Revised to indicate the modification effective date. No other updates were made to the cover page as the modification only addresses changes made as a result of the new design flow.
Part I.A.	Part I.A	Limitations and Monitoring Requirements. The previous effluent limits pages have been removed, and the permit now reflects a design flow of 0.100 MGD. See Table 2 above for the new flow specific limitations.
Part I.B.	[deleted]	Disinfection Study. This special condition is no longer applicable per current agency guidance (the permit manual) and has been deleted as its references pertain only to the previously permitted design flows.
Part I.C.1	Part I.B.1	95% Capacity Notification. (No additional changes)
Part I.C.2	Part I.B.2	O & M Manual. (No additional changes)
Part I.C.3	Part I.B.3	Licensed Operator. (No additional changes)
Part I.C.4	Part I.B.4	Reliability Class. Revised to reflect the requirements of the design flow permitted in the modified Part I.A.
Part I.C.5	Part I.B.5	Sludge Use and Disposal. (No additional changes)
Part I.C.6	Part I.B.6	Sludge Reopener. (No additional changes)
Part I.C.7	Part I.B.7	Compliance Reporting. Part I.B.7.e was added to clarify that the reporting requirements for nutrients differ and is addressed later in the permit.
Part I.C.8	Part I.B.8	Materials Handling/Storage. (No additional changes)
Part I.C.9	Part I.B.9	Reopeners. Revised in accordance with Guidance Memorandum 07-2008; consolidates the nutrient enriched waters, TMDL, and nutrient technology reopeners into one special condition.
Part I.C.10	Part I.B.10	Indirect Dischargers. (No additional changes)
Part I. C. 11	Part I.B.11	Pretreatment. (No additional changes)
Part I. C. 12	Part I.B.12	CTC, CTO Requirement. Revised in accordance with Guidance Memorandum 07-2008
	Part I.B.13	Nutrient Reporting Calculations. New, in accordance with Guidance Memorandum 07-2008
	Part I.B.14	Suspension of Annual Average Concentration Limitations for E3/E4 Facilities. New, in accordance with Guidance Memorandum 07-2008
	Part I.B.15	Water Quality Criteria Monitoring. New, in accordance with current guidance (Permit Manual Feb. 17, 2007) and recent revisions. The target values were carried forward from the Attachment A sent to the permittee on January 28, 2009 with the reissuance reminder letter (as opposed to utilizing the MSTRANT1 in Attachment 5 of this fact sheet to determine the values).

26. Public Notice Information required by 9 VAC 25-31-280 B:
Comment period: Publishing Newspaper: *Tidewater Review*
Publication Dates: May 27, 2009 and June 3, 2009
Start Date: May 27, 2009 End Date: June 26, 2009

All pertinent information is on file and may be inspected or copied by contacting Gina Kelly at:

Virginia Department of Environmental Quality (DEQ)
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060-6296

Telephone Number 804/527-5048
Facsimile Number 804/527-5106
Email vekelly@deq.virginia.gov

DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. DEQ may hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment.

Public Comment: None.

27. Additional Comments:
- a. Previous Board Action: None.
 - b. Staff Comments:
 - As this facility is currently undergoing an expansion and three years of effluent data are not available, performance-based monitoring reduction was not considered.
 - Financial assurance does not apply to this facility because it is a POTW.
 - A search using the DGIF database for threatened and endangered species was completed, and no such species were documented within a two mile radius of the outfall latitude and longitude. A search was also performed using the DCR Natural Heritage database, and no Natural Heritage resources were documented within a two mile radius of the outfall latitude and longitude. See **Attachment 7**.
 - The current permit authorizes discharges from a 0.025 MGD facility and allows for phase one of a three phase expansion up to a design flow of 0.050 MGD. This modification reflects the construction of phase one and two of the expansion by authorizing discharges from a 0.100 MGD facility. Although it is not included in this permit modification, HRSD eventually plans to increase the design flow of this facility to 0.15 MGD with the addition of a third MBR train (e.g. the completion of phase three). The TMDL is thereby being modified to reflect the current increase design flow (from 0.050 MGD to 0.100 MGD). The public notice template has been revised to reflect both the permit modification and the TMDL modification in an attempt to have the two public notices run concurrently.
 - A registration statement for the nutrient general permit has been received and the associated general permit issued. HRSD has elected to combine (i.e. "bubble") the

allocated loads for the York River facilities as allowed under the WGP; therefore, offset requirements for this expansion were not included in the permit modification.

- As an interim CTO was issued for the 0.100 MGD facility, annual average concentration limitations (effective beginning January 2010 and based on the calendar year) were established.
- This modification was not processed within 120 days from the completion date. While the modification process begun in 2006, it was suspended, at the request of the permittee, from August 2007 until December 2008 until concerns regarding the water quality standards sampling requirements (Attachment A) could be resolved. The resulting permit and fact sheet addendum reflect the policies and protocols in place at the time processing of the modification resumed in December 2008.
- As a major permit modification, this permit action required that the local government and downstream riparian landowners be notified of the proposed expansion. On September 11, 2006, correspondence was sent via USPS to Frank Pleva, the King William County Manager; five riparian landowners were notified in the same manner on September 18, 2006.

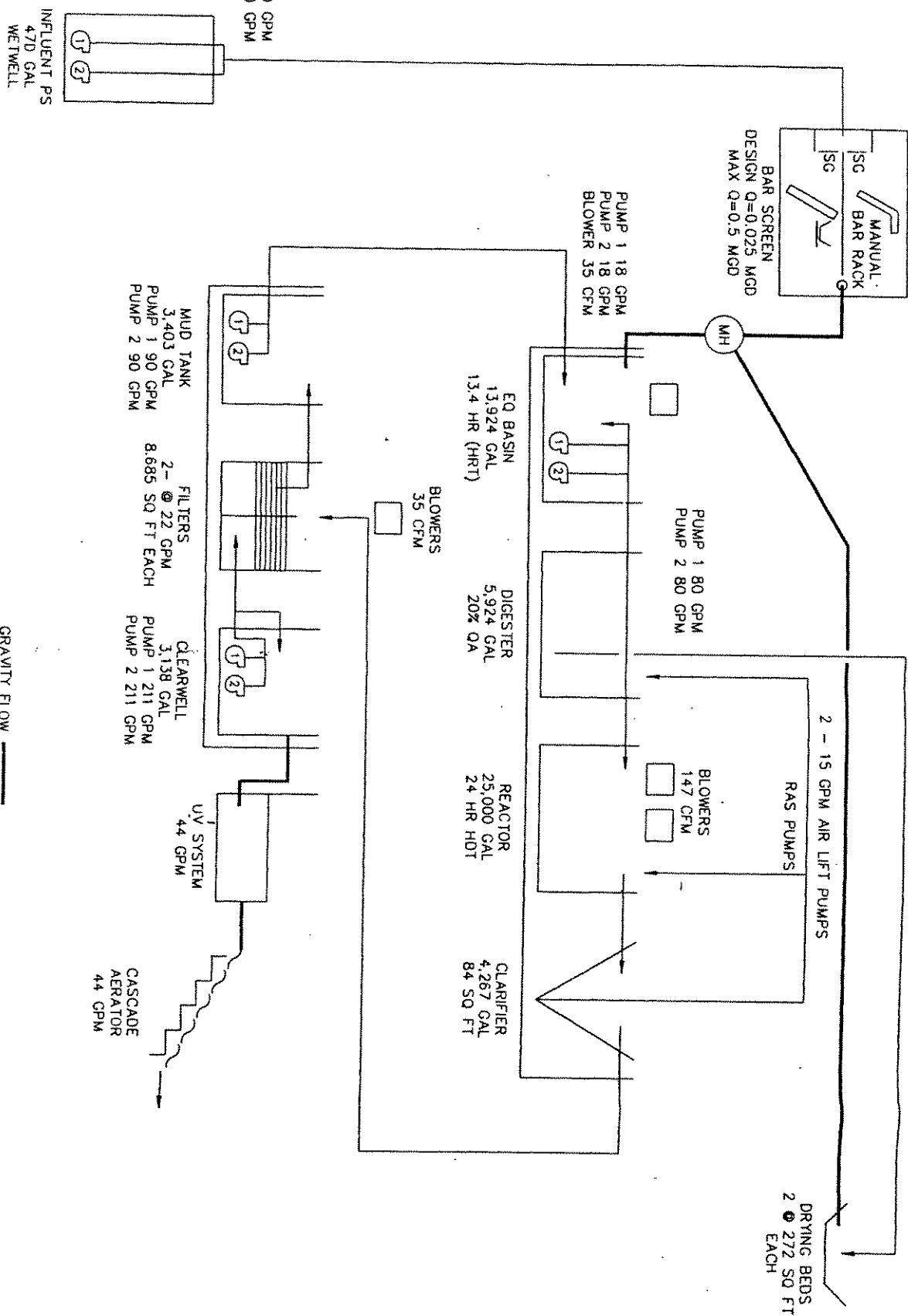
28. 303(d) Listed Segments (TMDL): This facility discharges directly to Moncuin Creek. The stream segment receiving the effluent is listed for not supporting the Aquatic Life and Recreation Uses in part I of the current approved 303(d) list. EPA approved the Bacteria TMDLs for the Pamunkey River Basin on August 2, 2006 for this segment. It contains an E.coli WLA of 8.71×10^10 CFU/year for this discharge. The TMDL is undergoing a modification (to be public noticed jointly with this permit modification) to allow for an increased WLA of 1.74×10^{11} based on a design flow of 0.100 MGD. Accordingly, this permit has final monthly geometric mean limits of 126 N/ 100 mL for E.coli that are in compliance with the TMDL. The segment is also listed as having a pH impairment; as this impairment is believed to be due to natural conditions and the facility has pH limitations, the facility should not contribute to that impairment. Additionally, mercury was listed as an observed effect due to a fish tissue screening value exceedence in largemouth bass in 2003. See **Attachment 2**.

29. Summary of attachments to this Fact Sheet:

Attachment 1	Facility Diagram and Expansion Plans
Attachment 2	Ambient Data and 303(d) Fact Sheets
Attachment 3	Site Visit
Attachment 4	Effluent Data
Attachment 5	Development of Ammonia Effluent Limitations
Attachment 6	Model of Conventional Pollutants
Attachment 7	Threatened and Endangered Species Information
Attachment 8	Permittee Comments and DEQ Response

Attachment 1

Facility Diagram and Expansion Plans



PLANT FLOW SCHEMATIC

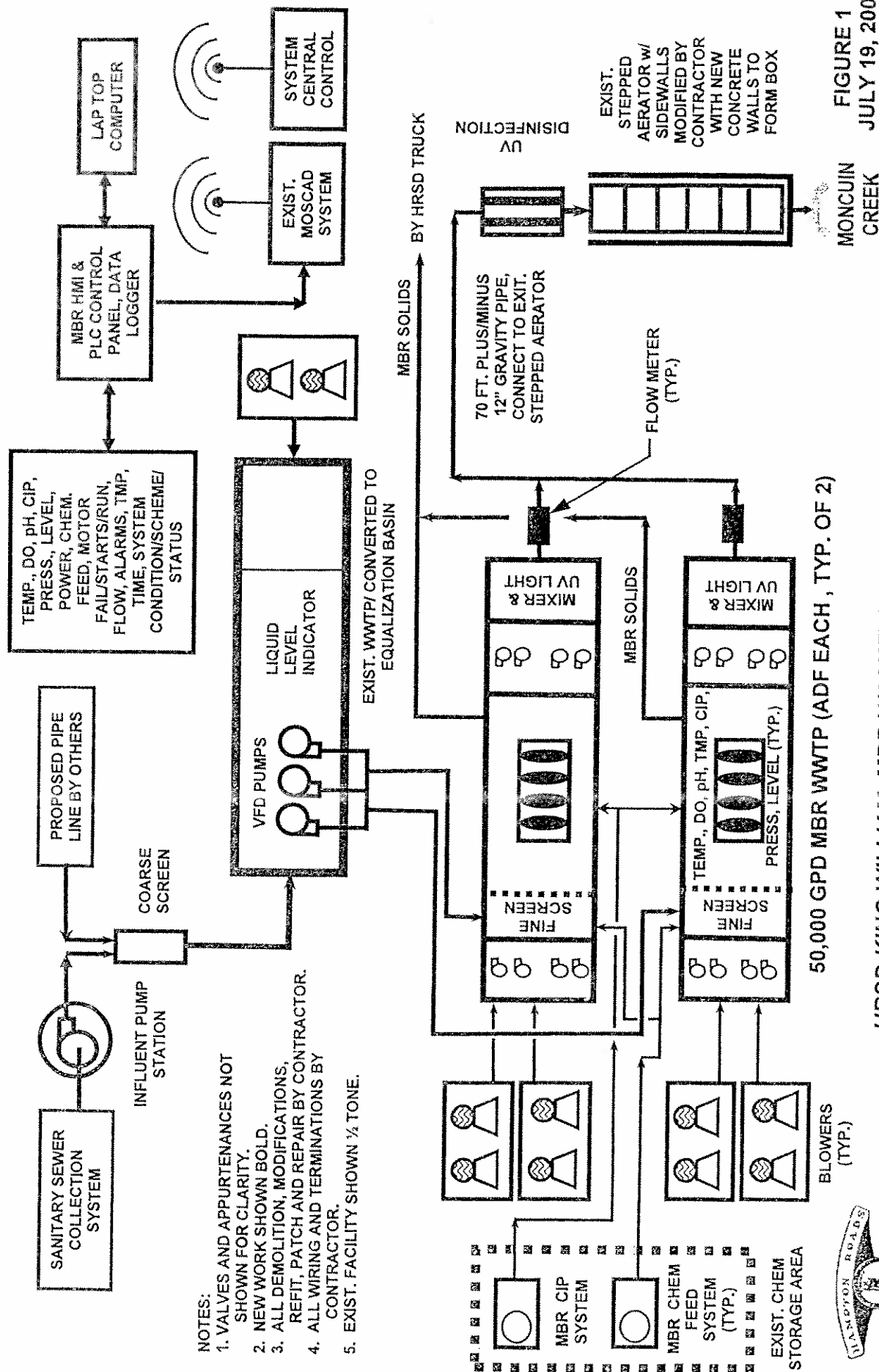
FIGURE 1-4

KING WILLIAM WASTEWATER
TREATMENT PLANT
KING WILLIAM COUNTY, VIRGINIA

Dewberry & Davis, Inc.
A Dewberry Company

Three James Center, 1051 East Cary St., Suite 800
Richmond, Virginia 23219-4025
tel (804) 643-8081 fax (804) 643-8083
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Architects
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Attachment 2


Ambient Data and 303(d) Fact Sheets

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office 4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
HRSD King William STP – VA0088102

TO: Gina R.E. Kelly

FROM: Jennifer V. Palmore, P.G. 

DATE: January 5, 2009

REVISED: April 15, 2009

COPIES: File

The Hampton Roads Sanitation District – King William Sewage Treatment Plant discharges to Monquin Creek near Manquin, VA. The outfall is located at river mile 8-MNQ003.75. Flow frequencies have been requested at this site for use in developing effluent limitations for the VPDES permit.

The DEQ has operated a continuous record gauge on Totopotomoy Creek near Studley, VA (#01673550) since 1978. The gauge is located at the Route 606 bridge in Hanover County. The flow frequencies on Monquin Creek were determined by drainage area proportion between the gauge and the discharge point. The values for the gauge and the discharge point are presented below.

Totopotomoy Creek near Studley, VA (#01673550):

Drainage area - 26.2 mi²

Statistical period - 1978-2003

1Q30 = 0.06 cfs	High Flow 1Q10 = 4.2 cfs
1Q10 = 0.24 cfs	High Flow 7Q10 = 5.6 cfs
7Q10 = 0.39 cfs	High Flow 30Q10 = 8.8 cfs
30Q10 = 0.85 cfs	HM = Undefined
30Q5 = 1.8 cfs	

Monquin Creek at discharge point:

Drainage Area = 9.01 mi²

1Q30 = 0.02 cfs (0.01 MGD)	High Flow 1Q10 = 1.4 cfs (0.93 MGD)
1Q10 = 0.083 cfs (0.053 MGD)	High Flow 7Q10 = 1.9 cfs (1.2 MGD)
7Q10 = 0.13 cfs (0.087 MGD)	High Flow 30Q10 = 3.0 cfs (2.0 MGD)
30Q10 = 0.29 cfs (0.19 MGD)	HM = Undefined
30Q5 = 0.62 cfs (0.40 MGD)	

This analysis does not address any withdrawals, discharges, or springs influencing the flow. The high flow months are January through May.

In 1998, Monquin Creek was assessed as fully supporting but threatened of the Recreation use because of fecal coliform violations at the Route 618 bridge (8-MNQ004.19). The stream was later downgraded to impaired and the impairment has subsequently converted to E. coli. During the 2008 cycle, the impairment was addressed as part of the "Bacteria Total Maximum Daily Load Development for the Pamunkey River Basin, March 2006", which was approved by the EPA on August 2, 2006 and by the SWCB on June 27, 2007. The facility was added to the TMDL during a subsequent modification and received a wasteload allocation of 8.71×10^{10} E. coli cfu/year. The allocation was based on a design flow of 0.050 MGD. The current permit application requests a flow expansion up to 0.10 MGD, which will require a TMDL modification before reissuance or a reduced permit limit.

Monquin Creek is assessed as not supporting of the Aquatic Life because of pH exceedances. The TMDL is due in 2014, however natural conditions are suspected. The stream is considered fully supporting of the Wildlife Use and fully supporting "with observed effects" of the Fish Consumption Use due to exceedance of a screening value exceedance for mercury in largemouth bass in 2003.

Monquin Creek was deemed a Tier 1 waterbody during the 2004 modeling effort and antidegradation was not applied. Because the facility is currently discharging at permit limits calculated using Tier 1, Monquin Creek remains a Tier 1 water.

The data analysis for station 8-MNQ004.19 is attached. The monitoring station is located on Monquin Creek at the Route 618 bridge, approximately 0.44 miles upstream of the discharge.

If you have any questions concerning this analysis, please let me know.

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler
8-MNQ004.19	6/30/1995	S	0.3	24.37	6.06	6.14	
8-MNQ004.19	6/19/1996	S	0.3	26.42	6.31	6.04	
8-MNQ004.19	9/18/1996	S	0.3	19.98	6.11	7.85	
8-MNQ004.19	12/11/1996	S	0.3	5.06	6.09	12.04	
8-MNQ004.19	3/26/1997	S	0.3	13.69	6.29	9.95	
8-MNQ004.19	6/16/1997	S	0.3	20.75	6.4	9.47	
8-MNQ004.19	7/8/1997	S	0.3	22.8	6.47	7.06	
8-MNQ004.19	8/29/1997	S	0.3				
8-MNQ004.19	9/15/1997	S	0.3	20.14	6.25	7.29	
8-MNQ004.19	11/3/1997	S	0.3	12.98	5.92	8.52	
8-MNQ004.19	1/5/1998	S	0.3	6.14	5.96	12.1	
8-MNQ004.19	3/11/1998	S	0.3	5.84	5.8	12.2	
8-MNQ004.19	5/6/1998	S	0.3	17.21	6.22	8.26	
8-MNQ004.19	7/7/1998	S	0.3	22.7	6.24	7.32	
8-MNQ004.19	9/21/1998	S	0.3	22.2	6.07	5.68	
8-MNQ004.19	11/23/1998	S	0.3	5.17	5.64	11.12	
8-MNQ004.19	1/14/1999	S	0.3	5	5.96	11.68	
8-MNQ004.19	3/8/1999	S	0.3	3.2	5.92	13.22	
8-MNQ004.19	5/24/1999	S	0.3	22.32	6.26	6.78	
8-MNQ004.19	7/22/1999	S	0.3	25.4	6.35	5.79	
8-MNQ004.19	9/15/1999	S	0.3	20.51	6.22	6.6	
8-MNQ004.19	11/4/1999	S	0.3	9.09	5.62	8.29	
8-MNQ004.19	3/15/2000	S	0.3	11.8	6.09	11.2	
8-MNQ004.19	5/25/2000	S	0.3	21.58	6.35	6.85	
8-MNQ004.19	7/17/2000	S	0.3	21.97	6.07	6.74	
8-MNQ004.19	9/27/2000	S	0.3	14.19	5.82	8.4	
8-MNQ004.19	11/2/2000	S	0.3	7.7	6.49	9.42	
8-MNQ004.19	3/27/2001	S	0.3	8.31	6.62	12.4	
8-MNQ004.19	7/8/2003	S	0.3	23.88	6.4	7.02	
8-MNQ004.19	8/12/2003	S	0.3	23.08	6.48	7.67	
8-MNQ004.19	8/28/2003	S	0.3	23.91	6.43	7.13	
8-MNQ004.19	9/9/2003	S	0.3	20.09	6.45	8.04	
8-MNQ004.19	10/7/2003	S	0.3	15.13	6.27	9.25	
8-MNQ004.19	10/23/2003	S	0.3	11.97	5.98	8.75	
8-MNQ004.19	11/4/2003	S	0.3	15.16	6.14	8.32	
8-MNQ004.19	12/2/2003	S	0.3	5.14	6.59	12.01	
8-MNQ004.19	12/29/2003	S	0.3	3.07	6.39	12.79	
8-MNQ004.19	1/6/2004	S	0.3	8.04	6.06	10.84	
8-MNQ004.19	2/9/2004	S	0.3	2.4	6.1	13.38	
8-MNQ004.19	2/24/2004	S	0.3	5.97	6.11	11.97	
8-MNQ004.19	3/9/2004	S	0.3	6.82	6.41	11.6	
8-MNQ004.19	4/6/2004	S	0.3	7.84	6.36	12.19	
8-MNQ004.19	4/21/2004	S	0.3	20.32	6.4	8.42	8.16
8-MNQ004.19	4/21/2004	S	0				
8-MNQ004.19	5/4/2004	S	0.3	12.61	5.98	9.54	
8-MNQ004.19	6/1/2004	S	0.3	21.25	6.34	7.44	
8-MNQ004.19	6/9/2004	S	0.3	22.37	6.44	7.37	
8-MNQ004.19	7/22/2004	S	0.3	24.32	6.28	6.82	
8-MNQ004.19	7/28/2004	S	0.3	23.3	6.67	6.2	
8-MNQ004.19	8/3/2004	S	0.3	23.57	5.53	6.25	
8-MNQ004.19	8/30/2004	S	0.3	23.34	6.64	6.95	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler
8-MNQ004.19	9/7/2004	S	0.3	21.75	6.11	7.21	
8-MNQ004.19	10/5/2004	S	0.3	16.86	5.66	9.22	
8-MNQ004.19	11/2/2004	S	0.3	15.91	5.94	8.73	
8-MNQ004.19	11/22/2004	S	0.3	13.14	5.85	9.3	
8-MNQ004.19	12/10/2004	S	0.3	10.62	6.05	9.3	
8-MNQ004.19	1/6/2005	S	0.3	10.13	6.63	10.34	
8-MNQ004.19	1/18/2005	S	0.3	0.39	6.18	15.31	
8-MNQ004.19	2/1/2005	S	0.3	2.17	6.71	13.11	
8-MNQ004.19	3/8/2005	S	0.3	8.6	6.28	10.92	
8-MNQ004.19	3/30/2005	S	0.3	11.22	6.63	11.12	
8-MNQ004.19	4/5/2005	S	0.3	10.71	6.14	10.39	
8-MNQ004.19	7/21/2008	S	0.3	26.4	6.6	5.7	
8-MNQ004.19	8/25/2008	S	0.3	22.2	6.9	5.2	
8-MNQ004.19	9/4/2008	S	0.3	21.8	6.5	6.3	
8-MNQ004.19	10/22/2008	S	0.3	9.9	6.6	9.6	
8-MNQ004.19	11/6/2008	S	0.3	15	6.4	7.4	
8-MNQ004.19	12/3/2008	S	0.3	3.3	6.6	13.1	
90th Percentile				23.7	6.6		
10th Percentile				5.0	5.9		
Average				14.9	6.2		

2008 Fact Sheets for 303(d) Waters

RIVER BASIN: York River Basin

HYDROLOGIC UNIT: 02080106

STREAM NAME: Moncuin Creek, Webb Creek

TMDL ID: F13R-04-PH

2008 IMPAIRED AREA ID: VAP-F13R-04

ASSESSMENT CATEGORY: 5C

TMDL DUE DATE: 2014

IMPAIRED SIZE: 11.82 - Miles

Watershed: VAP-F13R

INITIAL LISTING: 2002

UPSTREAM LIMIT:

DESCRIPTION: Headwaters of Webb Creek

DOWNSTREAM LIMIT:

DESCRIPTION: Swamp at river mile 2.0

From the headwaters of Webb Creek downstream to the swampy area around river mile 2.0.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting

IMPAIRMENT: pH

In the 2002 cycle, the segment was assessed not supporting of the Aquatic Life because of pH exceedances. The TMDL is due in 2014.

During the 2008 cycle, the segment remained impaired for pH:

pH 6/34 at 8-MNQ004.19 (Rt. 618);
pH 1/1 at 8-WEB002.00 (1995 study)

Natural conditions are suspected, therefore the water is considered a Category 5C water.

IMPAIRMENT SOURCE Natural Conditions

Natural conditions suspected source of pH violations.

RECOMMENDATION: Problem Characterization

2008 Fact Sheets for 303(d) Waters

RIVER BASIN: York River Basin

HYDROLOGIC UNIT: 02080106

STREAM NAME: Moncuin Creek, Webb Creek

TMDL ID: F13R-04-BAC

2008 IMPAIRED AREA ID: VAP-F13R-04

ASSESSMENT CATEGORY: 4A

TMDL DUE DATE: 2014

IMPAIRED SIZE: 11.82 - Miles

Watershed: VAP-F13R

INITIAL LISTING: 2002

UPSTREAM LIMIT:

DESCRIPTION: Headwaters of Webb Creek

DOWNSTREAM LIMIT:

DESCRIPTION: Swamp at river mile 2.0

From the headwaters of Webb Creek downstream to the swampy area around river mile 2.0.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Recreation Use - Not Supporting

IMPAIRMENT: E. coli

In 1998, Moncuin Creek was assessed as fully supporting but threatened of the Recreation use because of fecal coliform violations at the Route 618 bridge.

In the 2002 cycle, the segment was extended to incorporate the station on Webb Creek and was assessed not supporting of the Recreation Use because of fecal coliform exceedances. The TMDL was due in 2014. The impairment converted to E. coli during the 2006 cycle.

During the 2008 cycle, the bacteria TMDL was addressed as part of the Pamunkey River Basin Bacteria TMDL, which was approved by EPA on 8/2/2006. This should be considered a Category 4A water.

IMPAIRMENT SOURCE Point Sources, Nonpoint Sources

Allocations were given to both point and nonpoint sources in the watershed.

RECOMMENDATION: TMDL implementation

Attachment 3

Site Visit

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

UNSCHEDULED INSPECTION REPORT

FACILITY NAME:	<u>HRSD-King William STP</u>	INSPECTOR:	<u>Charles Stitzer</u>
PERMIT No.:	<u>VA0088102</u>	INSPECTION DATE:	<u>May 10, 2007</u>
TYPE OF FACILITY:	<u>Municipal Minor</u>	TIME OF INSPECTION:	<u>1550-1630 hrs</u>
COUNTY/CITY:	<u>King William</u>	REPORT COMPLETED:	<u>May 21, 2007</u>
REVIEWED BY:	<u>Heather A. Hane 5-21-07</u>	UNANNOUNCED INSPECTION:	<u>YES</u>
PRESENT DURING INSPECTION:	<u>Todd Heintz and Sharon Shoener</u>		

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

Facility Address: 542 Acquinton Church Road, King William Co. (near Rt. 360, VSH 618 and VSH 661)
Mailing Address: HRSD P.O. Box 5911 Virginia Beach, VA 23471
Contact: Todd Heintz: 804-776-0249

The wastewater treatment plant is under construction and is near completion. Mr. Todd Heintz, HRSD Lead Operator for Middle Peninsula, informed me that HRSD plans to seed the plant in May of '07 and begin discharging shortly thereafter. Wastewater is currently being pumped and hauled from what will become the plant's EQ basin. Quality of construction appears good and the grounds are being graded and sloped. Adequate E&S controls are in place.

The new STP will be a dual train membrane bioreactor unit utilizing UV disinfection and cascade aeration. It will be manned 8 hours per day, 7 days per week and will be supervised by, at least, a Class III Wastewater Operator.

Flow, pH, TSS, Fecal Coliform, DO, TKN and CBOD₅ will be monitored.

The STP laboratory is very small, but well outfitted for analyzing field parameters. Most analyses will be performed at another location.



Copies:

DEQ - OWPS (attn.: B. Purcell)
DEQ - PRO Compliance file (RR/L)

Attachment 4

Effluent Data

Parameter	Maximum Daily Value		Average Daily Value		
	Value	Units	Value	Units	No. Samples
pH (minimum)	6.0	S.U.			
pH (maximum)	8.5	S.U.			
Flow Rate	0.0030	MGD	0.002	MGD	cont.
Temperature (Winter)	16	°C	12	°C	90
Temperature (Summer)	25	°C	23	°C	91

Pollutant	Maximum Daily Discharge		Average Daily Discharge		
	Conc.	Units	Conc.	Units	No. Samples
cBOD ₅	5	mg/L	4	mg/L	7
Fecal Coliform	2400	mpn/ 100mL	18	mpn/ 100mL	22
TSS	25	mg/L	13	mg/L	7

pH	pH	pH	Temp C	Temp C	Temp C
7.7	6.3	6.9	23	18.2	18.0
7.9	6.1	6.6	23.9	16.0	16.0
8.0	6.0	7.1	24.7	16.2	16.3
7.2	6.3	7.2	24.1	16.0	17.7
7.7	6.2	7.8	24.1	15.0	18.5
7.4	6.2	6.8	21.0	15.0	17.4
8.3	6.2	7.3	24.6	16.8	17.0
7.5	6.1	7.6	24.7	18.0	16.0
7.2	6.0	6.1	23.5	16.0	18.0
7.5	6.3	7.0	24.5	19.6	19.0
7.5	6.2	7.3	25.0	19.7	19.2
8.2	8.1	7.8	21.9	17.8	18.8
8.5	6.1	6.8	21.0	17.4	16.4
8.1	7.1	6.2	21.0	14	18.0
7.9	7.2	6.6	21.0	13	16.4
7.4	7.4	7.3	19.0	11.1	17.2
7.5	6.7	7.6	22.4	13.0	15.3
7.1	6.6	6.5	21.0	15.0	16.7
7.3	7.0	6.5	22.0	15.4	17.6
7.2	6.8	6.1	23.3	14.4	18.3
6.8	6.6	7.7	22.4	15.0	16.0
7.2	7.0	7.9	23.1	15.9	16.4
7.1	6.4	6.2	22.0	14.3	10.9
6.4	6.3	8.1	22	14.4	9.8
6.7	7.0	6.7	27.5	13.9	9.0
6.5	6.7	7.7	23.0	14.4	7.0
7.0	6.2	7.3	24.9	13.2	6.0
6.7	6.1	7.4	21.5	14.0	11
6.9	6.2	6.9	20.3	14.4	9.2
6.4	7.3	6.9	22.0	11.0	10.7
6.8	6.2	6.9	20.1	10.0	12.4
6.6	7.0	6.9	20.0	14.0	10.0
6.5	6.7	7.7	21.0	15.0	10.0
6.7	6.6	8.4	21.3	14.0	8.5
6.8	7.1	7.5	20.5	11.7	13.2
6.6	7.3	6.2	20.5	12.8	12.2
7.2	6.8	6.1	20.3	11.0	7.3
7.2	6.8	6.3	20.0	12.0	9.0
6.3	6.9	6.4	20.0	14.0	11.2
7.2	6.8	6.5	20.3	12.7	10.5
7.3	7.0	6.5	19.0	12.0	10.8
7.0	6.6	6.2	17.7	11.7	10.9
6.5	6.5	6.1	19.2	9.8	10.0
6.5	6.3	7.1	19.0	9.6	13.0
6.5	6.1	6.3	20.5	9.7	11.0
90th%	7.7	7.7	90th%	23	23
10th%	6.2	6.2	10th%	10	10
Average	6.9	6.9	Average	17	17

Additional temperature and pH data to the left were submitted by the permittee on July 12, 2004 via email. These data were collected from September 1999 through March 2000.

Fact Sheet Addendum
HRSD King William STP

DMR Data

	Maximum Flow (MGD)	Minimum pH (S.U.)	Maximum pH (S.U.)	Mo Avg TSS (mg/L)	Minimum DO (mg/L)	Mo Avg TKN (mg/L)	Mo Avg cBOD ₅ (mg/L)
10-Jun-07	0.029	7.6	7.9	<QL	7	1.1	<QL
10-Jul-07	0.023	7	7.9	<QL	6.2	1	0.5
10-Aug-07	0.019	7.6	8.1	<QL	6.2	1	<QL
10-Sep-07	0.027	7.5	7.7	0.14	5.8	1	<QL
10-Oct-07	0.028	7	7.7	<QL	6.6	0.88	<QL
10-Nov-07	0.023	6.7	7.6	0.13	5.7	0.82	<QL
10-Dec-07	0.022	7	7.7	<QL	6.4	0.79	<QL
10-Jan-08	0.026	7.4	7.7	<QL	7.5	0.88	<QL
10-Feb-08	0.021	7.2	7.6	<QL	8.4	1.03	<QL
10-Mar-08	0.031	7.3	7.6	<QL	7.4	1.8	<QL
10-Apr-08	0.027	7.4	7.7	<QL	7.9	0.86	<QL
10-May-08	0.034	7.3	7.6	<QL	7.1	0.98	<QL
10-Jun-08	0.033	7.3	7.6	<QL	6.7	0.69	<QL
10-Jul-08	0.03	7.3	7.7	<QL	5.6	0.97	1
10-Aug-08	0.028	7.1	7.5	<QL	5.1	0.8	<QL
10-Sep-08	0.034	6.7	7.6	<QL	5.9	1	<QL
10-Oct-08	0.032	7.2	7.6	<QL	6.6	0.83	<QL
10-Nov-08	0.03	7.1	7.6	<QL	4	0.84	<QL
10-Dec-08	0.034	7	7.6	<QL	7.6	0.91	<QL
90th%	0.034	7.5	7.9	0.03	7.66	1.04	0.10
10th%	0.022	6.9	7.6	0.00	5.50	0.80	0.00
Average	0.028	7.2	7.7	0.01	6.51	0.96	0.08

*NOTE: Values reported as <QL were treated as zero in the summary calculations.

Attachment 5

Development of Ammonia Effluent Limitations

MIX.EXE and MSTRANTI DATA SOURCE REPORT

Stream Information: 8-MNQ004.19	
Mean Hardness	Ambient Monitoring Station data (Attachment 2)
90% Temperature	
90% Maximum pH	
10% Maximum pH	
Tier Designation	Flow Frequency Memorandum (Attachment 2)
Stream Width and Slope	BEJ – 2004 Mix.exe analysis
Bottom and Channel Scale	
Stream Flows	Flow Frequency Memorandum (Attachment 2)
Mixing Information	
All Data	MIX.exe
Effluent Information	
Mean Hardness	Minimum value of 25 mg/L as CaCO ₃ required
90% Temperature	Maximum Summer Temperature (See Attachment 4) Note: The 90 th % temperature value was not used as the data provided does not address the higher temperature months of April – August. Alternatively, the maximum summer temperature reported in the application was employed.
90% Maximum pH	DMR Data (See Attachment 4)
10% Maximum pH	
Discharge Flow	Design Flow

Mixing Zone Predictions for

HRSD King William

Effluent Flow = 0.100 MGD
Stream 7Q10 = 0.087 MGD
Stream 30Q10 = 0.19 MGD
Stream 1Q10 = 0.053 MGD
Stream slope = .00038 ft/ft
Stream width = 30 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .1378 ft
Length = 4454.46 ft
Velocity = .07 ft/sec
Residence Time = .7363 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .1795 ft
Length = 3567.18 ft
Velocity = .0834 ft/sec
Residence Time = .4953 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .1221 ft
Length = 4929.72 ft
Velocity = .0646 ft/sec
Residence Time = 21.1828 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 4.72% of the 1Q10 is used.

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: HRSO King William
Receiving Stream: Moncuin Creek

Permit No.: VA0088102

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information			Stream Flows			Mixing Information			Effluent Information							
Mean Hardness (as CaCO3) =	19 mg/L		1Q10 (Annual) =	0.053 MGD		Annual - 1Q10 Mix =	4.72 %		Mean Hardness (as CaCO3) =	25 mg/L						
90% Temperature (Annual) =	23.7 deg C		7Q10 (Annual) =	0.087 MGD		- 7Q10 Mix =	100 %		90% Temp (Annual) =	25 deg C						
90% Temperature (Wet season) =	deg C		30Q10 (Annual) =	0.19 MGD		- 30Q10 Mix =	100 %		90% Temp (Wet season) =	deg C						
90% Maximum pH =	6.6 SU		1Q10 (Wet season) =	MGD		Wet Season - 1Q10 Mix =	%		90% Maximum pH =	7.9 SU						
10% Maximum pH =	5.9 SU		30Q10 (Wet season) =	MGD		- 30Q10 Mix =	%		10% Maximum pH =	7.6 SU						
Tier Designation (1 or 2) =	1		30Q5 =	0.4 MGD					Discharge Flow =	0.1 MGD						
Public Water Supply (PWS) Y/N? =	n		Harmonic Mean =	MGD												
Trout Present Y/N? =	n		Annual Average =	MGD												
Early Life Stages Present Y/N? =	y															
Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Acenaphthene	0	--	--	na	2.7E+03	--	--	na	1.4E+04	--	--	--	--	--	--	na
Acrolein	0	--	--	na	7.8E+02	--	--	na	3.9E+03	--	--	--	--	--	--	na
Acrylonitrile ^c	0	--	--	na	6.6E+00	--	--	na	6.6E+00	--	--	--	--	--	--	na
Aldrin ^c	0	3.0E+00	--	na	1.4E+03	3.1E+00	--	na	1.4E+03	--	--	--	--	3.1E+00	--	na
Ammonia-N (mg/l) (Yearly)	0	1.38E+01	3.41E+00	na	--	1.4E+01	9.9E+00	na	--	--	--	--	--	1.4E+01	9.9E+00	na
Ammonia-N (mg/l) (High Flow)	0	1.01E+01	2.80E+00	na	--	1.0E+01	2.8E+00	na	--	--	--	--	--	1.0E+01	2.8E+00	na
Anthracene	0	--	--	na	1.1E+05	--	--	na	5.5E+05	--	--	--	--	--	--	na
Antimony	0	--	--	na	4.3E+03	--	--	na	2.2E+04	--	--	--	--	--	--	na
Arsenic	0	3.4E+02	1.5E+02	na	--	3.5E+02	2.8E+02	na	--	--	--	--	--	3.5E+02	2.8E+02	na
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Benzene ^c	0	--	--	na	7.1E+02	--	--	na	7.1E+02	--	--	--	--	--	--	na
Benzidine ^c	0	--	--	na	5.4E+03	--	--	na	5.4E+03	--	--	--	--	--	--	na
Benzo (a) anthracene ^c	0	--	--	na	4.9E+01	--	--	na	4.9E+01	--	--	--	--	--	--	na
Benzo (b) fluoranthene ^c	0	--	--	na	4.9E+01	--	--	na	4.9E+01	--	--	--	--	--	--	na
Benzo (k) fluoranthene ^c	0	--	--	na	4.9E+01	--	--	na	4.9E+01	--	--	--	--	--	--	na
Benzo (a) Pyrene ^c	0	--	--	na	1.4E+01	--	--	na	4.9E+01	--	--	--	--	--	--	na
Bis(2-Chloroethyl) Ether	0	--	--	na	1.4E+01	--	--	na	7.0E+01	--	--	--	--	--	--	na
Bis(2-Chloropropyl) Ether	0	--	--	na	1.7E+05	--	--	na	8.5E+05	--	--	--	--	--	--	na
Bromofom ^c	0	--	--	na	3.6E+03	--	--	na	3.6E+03	--	--	--	--	--	--	na
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	2.6E+04	--	--	--	--	--	--	na
Cadmium	0	8.2E-01	3.8E-01	na	--	8.4E-01	7.1E-01	na	--	--	--	--	--	8.4E-01	7.1E-01	na
Carbon Tetrachloride ^c	0	--	--	na	4.4E+01	--	--	na	4.4E+01	--	--	--	--	--	--	na
Chlordane ^c	0	2.4E+00	4.3E-03	na	2.2E+02	2.5E+00	8.0E-03	na	2.2E+02	--	--	--	--	2.5E+00	8.0E-03	na
Chloride	0	8.6E+05	2.3E+05	na	--	8.8E+05	4.3E+05	na	--	--	--	--	--	8.8E+05	4.3E+05	na
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	2.1E+01	na	--	--	--	--	--	1.9E+01	2.1E+01	na
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	1.1E+05	--	--	--	--	--	--	na
																1.1E+05

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane ^c	0	--	--	na	3.4E+02	--	--	na	3.4E+02	--	--	--	--	--	--	--	--	--	--	na	3.4E+02
Chloroform ^c	0	--	--	na	2.9E+04	--	--	na	2.9E+04	--	--	--	--	--	--	--	--	--	--	na	2.9E+04
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	--	--	na	2.2E+04
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	2.0E+03	--	--	--	--	--	--	--	--	--	--	na	2.0E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.5E-02	7.7E-02	na	--	--	--	--	--	--	--	--	--	8.5E-02	7.7E-02	na	--
Chromium III	0	1.8E-02	2.4E+01	na	--	1.9E+02	4.5E+01	na	--	--	--	--	--	--	--	--	--	1.9E+02	4.5E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	2.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	2.1E+01	na	--
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene ^c	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Copper	0	3.6E+00	2.7E+00	na	--	3.7E+00	5.1E+00	na	--	--	--	--	--	--	--	--	--	3.7E+00	5.1E+00	na	--
Cyanide	0	2.2E-01	5.2E+00	na	2.2E+05	2.3E+01	9.7E+00	na	1.1E+06	--	--	--	--	--	--	--	--	2.3E+01	9.7E+00	na	1.1E+06
DDD ^c	0	--	--	na	8.4E-03	--	--	na	8.4E-03	--	--	--	--	--	--	--	--	--	--	na	8.4E-03
DDE ^c	0	--	--	na	5.9E-03	--	--	na	5.9E-03	--	--	--	--	--	--	--	--	--	--	na	5.9E-03
DOT ^c	0	1.1E+00	1.0E-03	na	5.9E-03	1.1E+00	1.9E-03	na	5.9E-03	--	--	--	--	--	--	--	--	1.1E+00	1.9E-03	na	5.9E-03
Demeton	0	--	1.0E-01	na	--	--	1.9E-01	na	--	--	--	--	--	--	--	--	--	--	1.9E-01	na	--
DBenz(a,h)anthracene ^c	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Dibutyl phthalate	0	--	--	na	1.2E+04	--	--	na	6.0E+04	--	--	--	--	--	--	--	--	--	--	na	6.0E+04
Dichloromethane	0	--	--	na	1.6E+04	--	--	na	1.6E+04	--	--	--	--	--	--	--	--	--	--	na	1.6E+04
(Methylene Chloride) ^c	0	--	--	na	1.7E+04	--	--	na	8.5E+04	--	--	--	--	--	--	--	--	--	--	na	8.5E+04
1,2-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	--	--	na	1.3E+04
1,3-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	--	--	na	1.3E+04
1,4-Dichlorobenzene	0	--	--	na	7.7E-01	--	--	na	7.7E-01	--	--	--	--	--	--	--	--	--	--	na	7.7E-01
3,3-Dichlorobenzidine ^c	0	--	--	na	4.6E+02	--	--	na	4.6E+02	--	--	--	--	--	--	--	--	--	--	na	4.6E+02
Dichlorobromomethane ^c	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
1,2-Dichloroethane ^c	0	--	--	na	1.7E+04	--	--	na	8.5E+04	--	--	--	--	--	--	--	--	--	--	na	8.5E+04
1,1-Dichloroethylene	0	--	--	na	1.4E+05	--	--	na	7.0E+05	--	--	--	--	--	--	--	--	--	--	na	7.0E+05
1,2-Trans-dichloroethylene	0	--	--	na	7.9E+02	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
2,4-Dichlorophenol	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	3.9E+02	--	--	na	3.9E+02	--	--	--	--	--	--	--	--	--	--	na	3.9E+02
1,2-Dichloropropane ^c	0	--	--	na	1.7E+03	--	--	na	8.5E+03	--	--	--	--	--	--	--	--	--	--	na	8.5E+03
1,3-Dichloropropene	0	--	--	na	1.4E-03	2.5E-01	1.0E-01	na	1.4E-03	--	--	--	--	--	--	--	--	2.5E-01	1.0E-01	na	1.4E-03
Dieldrin ^c	0	2.4E-01	5.6E-02	na	1.2E+05	--	--	na	6.0E+05	--	--	--	--	--	--	--	--	--	--	na	6.0E+05
Diethyl Phthalate	0	--	--	na	5.9E+01	--	--	na	5.9E+01	--	--	--	--	--	--	--	--	--	--	na	5.9E+01
Di-2-Ethylhexyl Phthalate ^c	0	--	--	na	2.3E+03	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
2,4-Dimethylphenol	0	--	--	na	2.9E+06	--	--	na	1.5E+07	--	--	--	--	--	--	--	--	--	--	na	1.5E+07
Dimethyl Phthalate	0	--	--	na	1.2E+04	--	--	na	6.0E+04	--	--	--	--	--	--	--	--	--	--	na	6.0E+04
D-n-Butyl Phthalate	0	--	--	na	1.4E+04	--	--	na	7.0E+04	--	--	--	--	--	--	--	--	--	--	na	7.0E+04
2,4-Dinitrophenol	0	--	--	na	7.65E+02	--	--	na	3.8E+03	--	--	--	--	--	--	--	--	--	--	na	3.8E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	9.1E+01	--	--	na	9.1E+01	--	--	--	--	--	--	--	--	--	--	na	9.1E+01
2,4-Dinitrotoluene ^c	0	--	--	na	1.2E+06	--	--	na	na	--	--	--	--	--	--	--	--	--	--	na	na
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	na	5.4E+00	--	--	na	5.4E+00	--	--	--	--	--	--	--	--	--	--	na	5.4E+00
1,2-Diphenylhydrazine ^c	0	--	--	na	2.4E+02	2.3E-01	1.0E-01	na	1.2E+03	--	--	--	--	--	--	--	--	2.3E-01	1.0E-01	na	1.2E+03
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.3E-01	1.0E-01	na	1.2E+03	--	--	--	--	--	--	--	--	2.3E-01	1.0E-01	na	1.2E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	--	--	na	1.2E+03
Endosulfan Sulfate	0	--	--	na	2.4E+02	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	--	--	na	1.2E+03
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	8.8E-02	6.7E-02	na	4.1E+00	--	--	--	--	--	--	--	--	8.8E-02	6.7E-02	na	4.1E+00
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	4.1E+00	--	--	--	--	--	--	--	--	--	--	na	4.1E+00

Parameter (ug/l unless noted)	Background Conc	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.9E+04	--	--	na	1.5E+05	--	--	--	--	--	--	--	--	--	--	na	1.5E+05
Fluoranthene	0	--	--	na	3.7E+02	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Fluorene	0	--	--	na	1.4E+04	--	--	na	7.0E+04	--	--	--	--	--	--	--	--	--	--	na	7.0E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gulonic	0	--	1.0E-02	na	--	--	1.9E-02	na	--	5.3E-01	7.1E-03	na	2.1E-03	--	--	--	--	5.3E-01	7.1E-03	na	2.1E-03
Heptachlor ^C	0	5.2E-01	3.8E-03	na	2.1E-03	5.3E-01	7.1E-03	na	1.1E-03	5.3E-01	7.1E-03	na	7.7E-03	--	--	--	--	5.3E-01	7.1E-03	na	7.7E-03
Heptachlor Epoxide ^C	0	5.2E-01	3.8E-03	na	1.1E-03	5.3E-01	7.1E-03	na	7.7E-03	--	--	na	5.0E+02	--	--	--	--	--	--	na	5.0E+02
Hexachlorobenzene ^C	0	--	--	na	5.0E+02	--	--	na	1.3E-01	--	--	na	4.6E-01	--	--	--	--	--	--	na	4.6E-01
Hexachlorocyclohexane	0	--	--	na	4.6E-01	--	--	na	6.3E-01	9.7E-01	--	na	8.5E+04	--	--	--	--	9.7E-01	--	na	8.5E+04
Hexachlorocyclopentadiene	0	9.5E-01	na	na	6.3E-01	9.7E-01	--	na	8.9E+01	--	--	na	4.9E-01	--	--	--	--	--	--	na	4.9E-01
Hexachloroethane ^C	0	--	--	na	1.7E+04	--	--	na	2.6E+04	--	--	na	0.0E+00	--	--	--	--	--	--	na	0.0E+00
Hydrogen Sulfide	0	--	2.0E+00	na	4.9E-01	--	--	na	1.9E-01	2.1E+01	4.3E+00	na	--	--	--	--	--	2.1E+01	4.3E+00	na	--
Indeno (1,2,3-cd) pyrene ^C	0	--	1.0E-01	na	--	--	--	na	--	--	1.9E-01	na	--	--	--	--	--	--	1.9E-01	na	--
Iron	0	--	--	na	2.6E+04	--	--	na	2.6E+04	--	--	na	2.6E+04	--	--	--	--	--	--	na	2.6E+04
Isophorone ^C	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	0.0E+00	na	--
Kepone	0	2.0E+01	2.3E+00	na	--	2.1E+01	4.3E+00	na	--	--	1.9E-01	na	--	--	--	--	--	2.1E+01	4.3E+00	na	--
Lead	0	--	1.0E-01	na	--	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	na	4.9E-01
Malathion	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.4E+00	1.4E+00	na	2.6E-01	1.4E+00	1.4E+00	na	2.6E-01	--	--	--	1.4E+00	1.4E+00	na	2.6E-01	
Methyl Bromide	0	--	--	na	4.0E+03	--	--	na	2.0E+04	--	--	na	2.0E+04	--	--	--	--	--	--	na	2.0E+04
Methoxychlor	0	--	3.0E-02	na	--	--	5.6E-02	na	--	--	5.6E-02	na	--	--	--	--	--	--	5.6E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	0.0E+00	na	--
Monochlorobenzene	0	--	--	na	2.1E+04	--	--	na	1.1E+05	--	--	na	1.1E+05	--	--	--	--	--	--	na	1.1E+05
Nickel	0	5.6E+01	6.3E+00	na	4.8E+03	5.8E+01	1.2E+01	na	2.3E+04	5.8E+01	1.2E+01	na	2.3E+04	--	--	--	5.8E+01	1.2E+01	na	2.3E+04	
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	1.9E+03	--	--	na	9.5E+03	--	--	na	9.5E+03	--	--	--	--	--	--	na	9.5E+03
N-Nitrosodimethylamine ^C	0	--	--	na	8.1E+01	--	--	na	8.1E+01	--	--	na	8.1E+01	--	--	--	--	--	--	na	8.1E+01
N-Nitrosodiphenylamine ^C	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	na	1.6E+02
N-Nitrosodi-n-propylamine ^C	0	--	--	na	1.4E+01	--	--	na	1.4E-01	--	--	na	1.4E-01	--	--	--	--	--	--	na	1.4E-01
Parathion	0	6.5E-02	1.3E-02	na	--	6.7E-02	2.4E-02	na	--	6.7E-02	2.4E-02	na	--	--	--	--	6.7E-02	2.4E-02	na	--	
PCB-1016	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB-1221	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB-1232	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB-1242	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB-1248	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB-1254	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB-1260	0	--	1.4E-02	na	--	--	2.6E-02	na	--	--	2.6E-02	na	--	--	--	--	--	--	2.6E-02	na	--
PCB Total ^C	0	--	--	na	1.7E-03	--	--	na	1.7E-03	--	--	na	1.7E-03	--	--	--	--	--	--	na	1.7E-03

Parameter (ug/l unless noted) ^C	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Pentachlorophenol ^C	0	1.1E+01	3.1E+00	na	8.2E+01	1.2E+01	5.7E+00	na	8.2E+01	--	--	--	--	--	1.2E+01	5.7E+00	na	1.2E+01	5.7E+00	na	8.2E+01
Phenol	0	--	--	na	4.8E+06	--	--	na	2.3E+07	--	--	--	--	--	--	--	na	--	--	na	2.3E+07
Pyrene	0	--	--	na	1.1E+04	--	--	na	5.5E+04	--	--	--	--	--	--	--	na	--	--	na	5.5E+04
Radionuclides (pCi/l except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	na	--	--	na	--
Gross Alpha Activity Beta and Photon Activity (mrem/yr)	0	--	--	na	1.5E+01	--	--	na	7.5E+01	--	--	--	--	--	--	--	na	--	--	na	7.5E+01
Strontium-90	0	--	--	na	4.0E+00	--	--	na	2.0E+01	--	--	--	--	--	--	--	na	--	--	na	2.0E+01
Trinium	0	--	--	na	8.0E+00	--	--	na	4.0E+01	--	--	--	--	--	--	--	na	--	--	na	4.0E+01
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	2.1E+01	9.4E+00	na	5.5E+04	--	--	--	--	--	--	--	na	--	--	na	1.0E+05
Silver	0	3.2E+01	--	na	--	3.3E+01	--	na	--	--	--	--	--	--	--	2.1E+01	9.4E+00	--	--	na	5.5E+04
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	3.3E+01	--	--	--	na	--
1,1,2,2-Tetrachloroethane ^C	0	--	--	na	1.1E+02	--	--	na	1.1E+02	--	--	--	--	--	--	--	na	--	--	na	--
Tetrachloroethylene ^C	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	na	--	--	na	1.1E+02
Thallium	0	--	--	na	6.3E+00	--	--	na	3.2E+01	--	--	--	--	--	--	--	na	--	--	na	8.9E+01
Toluene	0	--	--	na	2.0E+05	--	--	na	1.0E+06	--	--	--	--	--	--	--	na	--	--	na	3.2E+01
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	na	--	--	na	1.0E+06
Toxaphene ^C	0	7.3E+01	2.0E+04	na	7.5E+03	7.5E+01	3.7E+04	na	7.5E+03	--	--	--	--	--	--	7.5E+01	3.7E+04	--	--	na	7.5E+03
Tributyltin	0	4.6E+01	6.3E+02	na	--	4.7E+01	1.2E+01	na	--	--	--	--	--	--	--	4.7E+01	1.2E+01	--	--	na	--
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	4.7E+03	--	--	--	--	--	--	--	na	--	--	na	4.7E+03
1,1,2-Trichloroethane ^C	0	--	--	na	4.2E+02	--	--	na	4.2E+02	--	--	--	--	--	--	--	na	--	--	na	4.2E+02
Trichloroethylene ^C	0	--	--	na	8.1E+02	--	--	na	8.1E+02	--	--	--	--	--	--	--	na	--	--	na	8.1E+02
2,4,6-Trichlorophenol ^C	0	--	--	na	6.5E+01	--	--	na	6.5E+01	--	--	--	--	--	--	--	na	--	--	na	6.5E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	na	--	--	na	--
Vinyl Chloride ^C	0	--	--	na	6.1E+01	--	--	na	6.1E+01	--	--	--	--	--	--	--	na	--	--	na	6.1E+01
Zinc	0	3.6E+01	3.6E+01	na	6.9E+04	3.7E+01	6.8E+01	na	3.5E+05	--	--	--	--	--	--	3.7E+01	6.8E+01	--	--	na	3.5E+05

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
 = (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	2.2E+04
Arsenic	1.4E+02
Barium	na
Cadmium	3.4E-01
Chromium III	2.7E+01
Chromium VI	6.8E+00
Copper	1.5E+00
Iron	na
Lead	2.6E+00
Manganese	na
Mercury	2.6E-01
Nickel	7.0E+00
Selenium	5.6E+00
Silver	1.3E-01
Zinc	1.5E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

changes from draft J. 1. Endrin Aldehyde criteria corrected

Fact Sheet Addendum
HRSD King William STP

Ammonia

Facility = HRSD King William
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 14
WLAc = 9.9
Q.L. = 0.2
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average = 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity

Maximum Daily Limit = 14.0
Average Weekly limit = 14.0
Average Monthly Limit = 14.0

The data are:

9.00

Note: 9.00 mg/L was used to force a limitation per Guidance Memorandum 00-2011. As indicated, the monthly average ammonia limitation is 14.0 mg/L and the weekly average limitation is 14.0 mg/L. However, modeling established a monthly average TKN of 3.0 mg/L with a corresponding weekly average of 4.5 mg/L. GM00-2011 advises that the agency has defined nitrogenous BOD as TKN and assumes that all nitrogenous BOD will be hydrolyzed to ammonia in the stream. Therefore, the permit will limit the more stringent of the two proposed limits, here TKN. While only TKN is monitored and limited, this limit will also result in maintenance of the ammonia toxicity water quality criteria.

Attachment 6

Model of Conventional Pollutants

MEMORANDUM


DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296

804/527-5020

SUBJECT: Stream Sanitation Analysis – Moncuin Creek
HRSD-King William STP discharge (VA0088102)

TO: Gina Ebbett

FROM: Jennifer Palmore 

DATE: March 3, 2004

COPIES: Mark Alling, Model File

A request for a stream sanitation analysis for the HRSD-King William sewage treatment plant (STP) discharge was received on February 3, 2004. The request was submitted because the permittee has requested a tiered increase in design flow from the current 0.025 MGD to 0.05, 0.1, and finally 0.15 MGD.

The STP discharges into Moncuin Creek near Manquin in King William County. The current limits were recommended by Jon van Soestbergen in 1997 (memo attached). At that time, the flow frequency analysis indicated that the 7Q10 of Moncuin Creek was 0.0 cfs. The analysis was performed by correlating stream measurements taken on Acquinton Creek at the Route 629 bridge (#01673620) with the stream gauge on Totopotomoy Creek near Studley (#0167000) and then doing a drainage area comparison between Acquinton and Moncuin Creeks. As the 7Q10 was 0.0 cfs, the stream was determined to be unmodelable and limits were recommended based on best professional judgement. However, the memo indicates that the stream was free flowing at the discharge point with a marshy area 1.6 miles downstream that should be used as a boundary condition at which DEQ swamp limits would be applied in any future modeling.

An updated flow frequency analysis was performed on 1/8/2004. Acquinton Creek was deemed to be a poor comparison to Moncuin and the flow frequencies were recalculated by drainage area comparison between Moncuin and Totopotomoy Creeks. The analysis indicated a 7Q10 flow of 0.15 cfs, indicating that there is flow at 7Q10 conditions.

A site visit was performed on March 2, 2004. As previously stated, the stream has a defined channel and stream flow was high. Moncuin Creek was therefore modeled using Regional Model 4.1. The stream is deemed a Tier 1 water because it is currently on the 303(d) list Total Maximum Daily Load Priority List as impaired of the Aquatic Life Use due to violations of the pH standard. The impairment is attributed to natural conditions. The stream is also impaired of the Recreation Use due to fecal coliform exceedances, however this is not a factor in the Tier determination.

The following discharge limits are recommended to maintain water quality standards in Moncuin Creek and to meet the DEQ swamp limits at the downstream boundary:

Q = 0.05 MGD
cBOD₅ = 19 mg/L
TKN = 3 mg/L
DO = 5 mg/L

Q = 0.1 MGD
cBOD₅ = 13 mg/L
TKN = 3 mg/L
DO = 5 mg/L

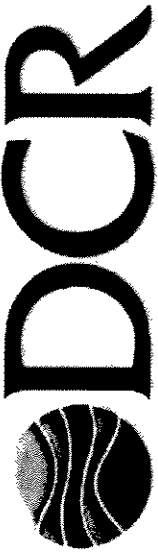
Q = 0.15 MGD
cBOD₅ = 10 mg/L
TKN = 3 mg/L
DO = 5 mg/L

X 1.5 MGD

The modeling documentation is attached. If you have any questions or need any additional information, please do not hesitate to contact me.

Attachment 7

Threatened and Endangered Species Information



Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

PROJECT INFORMATION

TITLE: HRSD King William expansion

DESCRIPTION: Increasing the WWTP size and discharge flow

EXISTING SITE CONDITIONS: RPA near outfall structure

QUADRANGLES: MANQUIN

COUNTIES: King William

Latitude/Longitude (DMS): 3742224/770839

Acreage: 17

Comments: Please disregard the same project submitted on 1/30/07.

This project involves the modification of a VPDES permit to allow the wastewater treatment plant to increase its design flow to a total of 0.150 MGD.

REQUESTOR INFORMATION

Contact Name: Gina Kelly

Company Name: DEQ-Piedmont Regional Office

Address: 4949 A Cox Rd

City: Glen Allen

State: VA

Zip: 23060

Phone: 804-527-5048

Fax: 804-527-5106

Email: vekelly@deq.virginia.gov



Quads: MANQUIN

Courties: King William

HRSD King William expansion

Company: DEQ-Piedmont
Regional Office
Lat/Long: 374224/770839

L. Preston Bryant, Jr
Secretary of Natural Resources

Joseph H. Maroon
Director



COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

The project mapped as part of this report has been searched against the Department of Conservation and Recreation's Biotics Data System for occurrences of natural heritage resources in the vicinity of the area indicated for this project. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in Biotics files, natural heritage resources have not been documented within two miles of the identified project boundaries. In addition, our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks additional natural heritage resources. New and updated information is continually added to Biotics. Please revisit this website or contact DCR for an update on this natural heritage information if a significant amount of time passes (DCR recommends no more than one year) before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in the Natural Heritage Data Explorer. Their database may be accessed from http://www.dgif.virginia.gov/wildlife/info_map/index.html, or contact Shirl Dressler at (804) 367-6913.

Thank you for submitting your project to the Virginia Department of Conservation and Recreation's Natural Heritage Data Explorer Web Service. Should you have any questions or concerns about this report, the Data Explorer, or other Virginia Natural Heritage Program services, please contact the Natural Heritage Project Review Unit at 804-371-2708.



Project Review Report

List of threatened and endangered species and wildlife resources known or likely to occur within a **2 mile radius of (point 37,42,24 -77,08,39)** in **101 King William, Va.** This report is compiled on 1/30/2007,10:29:57 AM

Threatened and Endangered Species Occurrences.

Bova Code	Status*	Common Name	Scientific Name	Confirmed	Database(s)
040093	FTST	Eagle, bald	Haliaeetus leucocephalus	No	BOVA
040129	ST	Sandpiper, upland	Bartramia longicauda	No	BOVA
040379	FSST	Sparrow, Henslows	Ammodramus henslowii	No	BOVA
010032	FSSS	Sturgeon, Atlantic	Acipenser oxyrhynchus	No	BOVA
030067	FSCC	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	No	BOVA
040110	FS	Rail, black	Laterallus jamaicensis	No	BOVA
040320	FS	Warbler, cerulean	Dendroica cerulea	No	BOVA
040029	SS	Heron, little blue	Egretta caerulea caerulea	No	BOVA
040032	SS	Egret, great	Ardea alba egretta	No	BOVA
040034	SS	Heron, tricolored	Egretta tricolor	No	BOVA
040036	SS	Night-heron, yellow-crowned	Nyctanassa violacea violacea	No	BOVA
040094	SS	Harrier, northern	Circus cyaneus	No	BOVA
040112	SS	Moorhen, common	Gallinula chloropus cachinnans	No	BOVA
040180	SS	Tern, Forsters	Sterna forsteri	No	BOVA
040189	SS	Tern, Caspian	Sterna caspia	No	BOVA
040204	SS	Owl, barn	Tyto alba pratincola	No	BOVA
040262	SS	Nuthatch, red-breasted	Sitta canadensis	No	BOVA
040264	SS	Creeper, brown	Certhia americana	No	BOVA
040266	SS	Wren, winter	Troglodytes troglodytes	No	BOVA
040278	SS	Thrush, hermit	Catharus guttatus	No	BOVA
040285	SS	Kinglet, golden-crowned	Regulus satrapa	No	BOVA
040314	SS	Warbler, magnolia	Dendroica magnolia	No	BOVA
040364	SS	Dickcissel	Spiza americana	No	BOVA
040366	SS	Finch, purple	Carpodacus purpureus	No	BOVA

050045	SS	Otter, northern river	Lontra canadensis lataxina	No	BOVA
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*FE=Federal Endangered; FT=Federal Threatened; FC=Federal Candidate; FS=Federal Species of Concern (not a legal status; list maintained by USFWS Virginia Field Office); SE=State Endangered; ST=State Threatened; SS=State Special Concern (not a legal status).

Anadromous Fish Use Reaches Records .

Stream ID	Stream Name	Reach Status	
<u>C58</u>	Pamunkey river	Confirmed	<u>Yes</u>

Colonial WaterBird (CWB) Survey Records


[View all Maps](#)

CWB ID	Survey Name	View Map
<u>177</u>	The Meadows	<u>Yes</u>
<u>2003767</u>	The Meadows	<u>Yes</u>
<u>2003768</u>	The Meadows	<u>Yes</u>

Threatened and Endangered Species Waters - No Records found.

Summary of Recent Cold Water Stream Survey (CWSS) Reaches (Click on Reach ID to view complete reach history) - No Records found.

Commonwealth of Virginia Land Holdings

No records found for the search area.

USGS Hydrological Unit(s): Mid Atlantic Region: Mattaponi River
Mid Atlantic Region: Pamunkey River
Mid Atlantic Region: York River

USGS 7.5' Quadrangles: Manquin
King William

Attachment 8

Permittee Comments and DEQ Response



HRSD

P.O. BOX 5911, VIRGINIA BEACH, VIRGINIA 23471-0911 • (757) 460-7004 • FAX: (757) 318-6452

www.hrsd.com

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Gloucester

Isle of Wight

James City

King & Queen

King William

Mathews

Middlesex

York

April 28, 2009

Emailed to vekelly@deq.virginia.gov

Virginia Kelly
Dept of Environmental Quality
4949-A Cox Road
Glen Allen, VA 23060

RE: King William STP VA0088102 Permit Modification

Dear Mrs. Kelly,

HRSD has reviewed the proposed permit modification for the King William STP and offers the following comments for your consideration.

Part I.A.1

Under the current permit, the cBOD5 and TSS analyses are conducted on 8-hour composite samples. HRSD requests that the sample type remain the same instead of the proposed 4-hour composite. This will streamline the sampling procedure for our operators.

Under the current permit, HRSD reports the cBOD5 and TKN loading averages using the units of kilogram/day. The fact sheet does not provide a rationale for changing the units. HRSD requests that the loading averages for these parameters continue to be reported in kilograms/day instead of the proposed grams/day.

Part I.B.7.b.

This special condition of the draft permit conflicts with the requirements of VPDES permit number VAN030052 which also applies to the King William STP. The General Permit for Nutrients states that "all daily concentration data below the quantification level (QL) for the analytical method used should be treated as half the QL." Since the TKN data is reported on the DMR for both VPDES permit VA0088102 and VAN030052, it is HRSD's position that the data should be treated in the same manner for both permits. Consequently, HRSD requests that the calculation requirements noted in I.B.7.b. apply only to cBOD5 and TSS. Any calculations involving TKN data that is less than QL would use one-half of the QL.

The General Permit for Nutrients states that "all daily concentration data below the quantification level (QL) for the analytical method used should be treated as half the QL." Proposed special condition I.B.13. directs the permittee to treat Total Nitrogen data that is below the QL as a zero. The language states that if one

of the species data used for TN is less than QL, then the species data value that is greater than the QL should be reported. Currently, HRSD uses one-half of the QL of any nutrient data values for reporting on the general permit nutrient DMRs. Often, the NOx data value is below QL so one-half of the NOx QL is added to the TKN value and reported as the daily concentration. It would be extremely burdensome and confusing to report two different monthly averages to the same agency for the same facility. Therefore, HRSD requests that the next to the last paragraph of this section be modified so that it applies to all nutrient data instead of only total phosphorus and the last paragraph, which discusses TN calculations, be deleted.

Part I.B.15.

This special condition references monitoring of the parameters listed on Attachment A. The section requires that monitoring occur 180 days after the effective date of the permit modification. As noted in the fact sheet, HRSD received Attachment A in the package for the permit renewal in January 2009. Consequently, HRSD has already scheduled sampling for Attachment A which will occur *prior* to the effective date of the permit modification. Since the monitoring is a requirement of the permit renewal application which will be submitted to your office within the next few months, HRSD requests that Special Condition I.B.15 be deleted as it will only result in sampling being delayed which may cause compliance problems with meeting the permit application deadline requirement.

Attachment A

Footnote 1 of Attachment A is a bit confusing as it infers that the Specific Target Values may become the effluent limitations. It states that they are the “approximate values” for the initiation of the wasteload allocation analysis. HRSD recommends that the second paragraph of the footnote 1 be deleted. The first paragraph is the relevant part of the footnote as it defines QL. The second paragraph expounds on DEQ’s intentions with the data and would be better suited in the fact sheet. As a general comment, HRSD recommends that the QLs be based on the analytical method. As noted in some of our comments below, some of the STVs may not be achievable.

Attachment A requires a QL of 0.049 ug/l for dissolved silver. The ICP-MS QL, which is the most sensitive approved method, is 0.05 ug/l.

The dissolved copper QL is listed as 0.56 ug/l. HRSD uses the ICP-MS method which has a QL is 0.5 ug/l. There may be a problem meeting this required QL due to matrix interference which would require diluting the sample.

Sulfide will be analyzed as a surrogate for hydrogen sulfide as there is no approved method for hydrogen sulfide in wastewater.

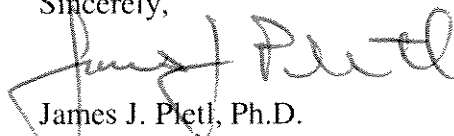
HRSD plans to report Beta Particle and Photon Activity in pCi/L since those are the units used by the contract laboratory to report the analyses.

HRSD will use EPA method 608 for kepone analysis. We believe this method to be more reliable than SW846 method 8270D.

Footnote 2 requires that the composite sample be a four-hour composite unless otherwise specified. In order to provide DEQ with the best representative effluent data, HRSD plans to collect 24-hour composite samples.

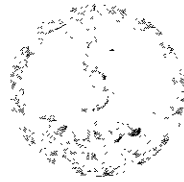
Please contact me if you have any questions.

Sincerely,

A handwritten signature in dark ink, appearing to read "James J. Pletl", written over a faint rectangular box.

James J. Pletl, Ph.D.

Chief of Technical Service Division



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE

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Preston Bryant
Secretary of Natural Resources

David K. Pavlor
Director

MAY 13 2009

James Pletl, Chief of Technical Services
Hampton Roads Sanitation District
P.O. Box 5911
Virginia Beach, VA 23471-0911

RE: HRSD King William (VA0088102) Draft Permit Modification Comments

Dear Dr. Pletl:

The DEQ permitting staff has reviewed your comments to the King William STP draft permit modification received in a letter dated April 28, 2009. DEQ offers the following responses:

Item 1: cBOD5 and TSS Sample Type

HRSD has requested the sample type remain at 8- hour composite samples as opposed to the proposed 4- hour composite samples. DEQ is amenable to this revision.

Item 2: cBOD5 and TKN Loadings

HRSD has requested that the loading limits for these two parameters be expressed in kilograms per day as opposed to grams per day. Guidance Memorandum 06-2016 states that limits containing one significant figure are appropriate only in three cases, including BOD; however the intent of the guidance applies this concept only to concentrations. In accordance with this Guidance Memorandum, the cBOD₅ and TKN loading limitations will remain expressed in grams per day.

Item 3: Compliance Reporting and Nutrient Reporting Calculations

HRSD has requested that Part I.B.7 be revised to match more closely the requirements of the Watershed Nutrient General Permit (VAN030052); it was noted that the general permit directs the permittee to use one-half the quantification level (QL) if the results are less than the QL whereas the draft individual permit requires a different method, in accordance with Guidance Memorandum 07-2008, Amendment 2. DEQ Central Office staff have acknowledged this discrepancy and have requested that the individual permit remain as drafted. Statewide seminars have been given which instructed permittees to calculate the daily average concentrations in a manner consistent with the guidance memorandum; a copy of this presentation is attached. Additionally, Central Office staff have advised that the nutrient general permit regulation will be revised to clarify this preferred calculation method when that general permit is reissued.

Item 4: Attachment A Sampling

HRSD has asked that special condition B.15 be removed from the permit as the required testing will be submitted with the permit reissuance application that is due and the this testing has been scheduled to occur prior to the effective date of the permit modification. To avoid unnecessary and duplicative testing, DEQ will remove this special condition as requested.

Regarding the additional comments on the Attachment A document, DEQ staff appreciate your concerns and will take this input under advisement when the form is next revised.

This letter is intended to provide information on the conditions that DEQ intends to include in your draft permit modification that will proceed to public notice. If you would like to discuss the information contained in this letter or participate in a meeting to discuss your concerns, please contact me at 804/527-5048 or via email at vekelly@deq.virginia.gov.

Sincerely,

A handwritten signature in cursive script that reads "Virginia Kelly".

Virginia R.E. Kelly, P.E.
Environmental Engineer

cc: file

Nutrient Reporting Using QLs

"Now the Real Fun Begins"



Nutrient General Permit

- No QL's specified in General Permit
 - Must be determined by lab
- General Permit states:
 - If less than ($<$) QL, treat as half the QL for the analytical method
 - If greater or equal to (\geq) QL, treat as reported

5/13/2009

Nutrient General Permit

2

Regulation (9 VAC 25-820-10 *et seq.*)

- Defines "Quantification Level (QL)" as the lowest standard in the calibration curve for a given analyte
- The QL must have a value greater than ($>$) zero and be verified each day of analysis by analyzing a sample of known concentration at the selected QL with a recovery range of 70 – 130%
- Not in Permit!

5/13/2009

Nutrient General Permit

3

Calculating Monthly Average Concentrations with QLs

5/13/2009

Nutrient General Permit

4

Monthly Average Concentrations

- All parameters are to be calculated using $\frac{1}{2}$ QL where appropriate
- Monthly average concentrations reported on DMR must not use less than ($<$) symbol

Example:

Total Phos = $<$ QL (where QL = 0.02mg/L)

Use 0.01 mg/L for calculating averages

5/13/2009

Nutrient General Permit

5

Loading Calculations

- Daily concentration data:
 - Below the QL should be treated as half the QL
 - Greater or equal to (\geq) QL, treat as reported

Example:

Total Phos = $<$ QL (where QL = 0.02mg/L)

Use 0.01 mg/L for loading calculations

5/13/2009

Nutrient General Permit

6

Calculating Total Nitrogen Concentrations with QLs

* DEQ Guidance Memo No. 07-2008, Amendment #2

5/12/2009

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Example 1

- All data is less than (<) QL:

TKN	<0.50 mg/L
NO ₂	<0.05 mg/L
NO ₃	<0.10 mg/L

5/12/2009

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Example 1 (answer)

- Record TN on daily log as less than (<) the highest QL

TKN (N-KJEL) = <0.50 mg/L

Nitrite + Nitrate-N, Total = <0.10 mg/L

- Total Nitrogen as N = <0.50 mg/L**

- Use 1/2 TN QL (0.25) for all calculations
- Use 1/2 TKN (0.25) and NO₂/NO₃ (0.05) QL for calculating monthly averages

5/13/2009

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Example 2

- One parameter has 'hit' and others are less than (<) QL:

TKN	<0.50 mg/L
NO ₂	<0.05 mg/L
NO ₃	0.40 mg/L

5/13/2009

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Example 2 (answer)

- Less than (<) QL results are treated as though nothing is present
- 'Hit' concentrations are reported **EVEN IF** the 'hit' is below the QL that is 'less than'.

TKN (N-KJEL) = <0.50 mg/L

Nitrite + Nitrate-N, Total = 0.40 mg/L

- Total Nitrogen as N = 0.40 mg/L**

5/13/2009

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Example 3

- Three 'hits':

TKN	0.60 mg/L
NO ₂	0.08 mg/L
NO ₃	0.64 mg/L

5/13/2009

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Example 3 (answer)

- Report sum of all 'hits'
 - TKN (N-KJEL) = 0.60 mg/L
 - Nitrite + Nitrate-N, Total = 0.72 mg/L
- **Total Nitrogen as N = 1.32 mg/L**

5.13.2009

13

Remember!

- QLs for nutrient parameters are not listed in general permit
- The QL must have a value greater than (>) zero and be verified each day of analysis by analyzing a sample of known concentration at the selected QL with a recovery range of 70 – 130%

5.13.2009

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